January 2017 Water Supply Briefing

National Weather Service/Northwest River Forecast Center

Telephone Conference : 1-888-677-0012
Pass Code : 91999

2017 Briefing Dates:

Jan 5 – 10am Pacific Time
Feb 2 - 10am Pacific Time
March 2 - 10am Pacific Time
April 6 - 10am Daylight Savings Time
May 4 - 10am Daylight Savings Time

Kevin Berghoff, NWRFC
W-ptr.Webmaster@noaa.gov
(503)326-7291

Water Supply Forecast Briefing Outline

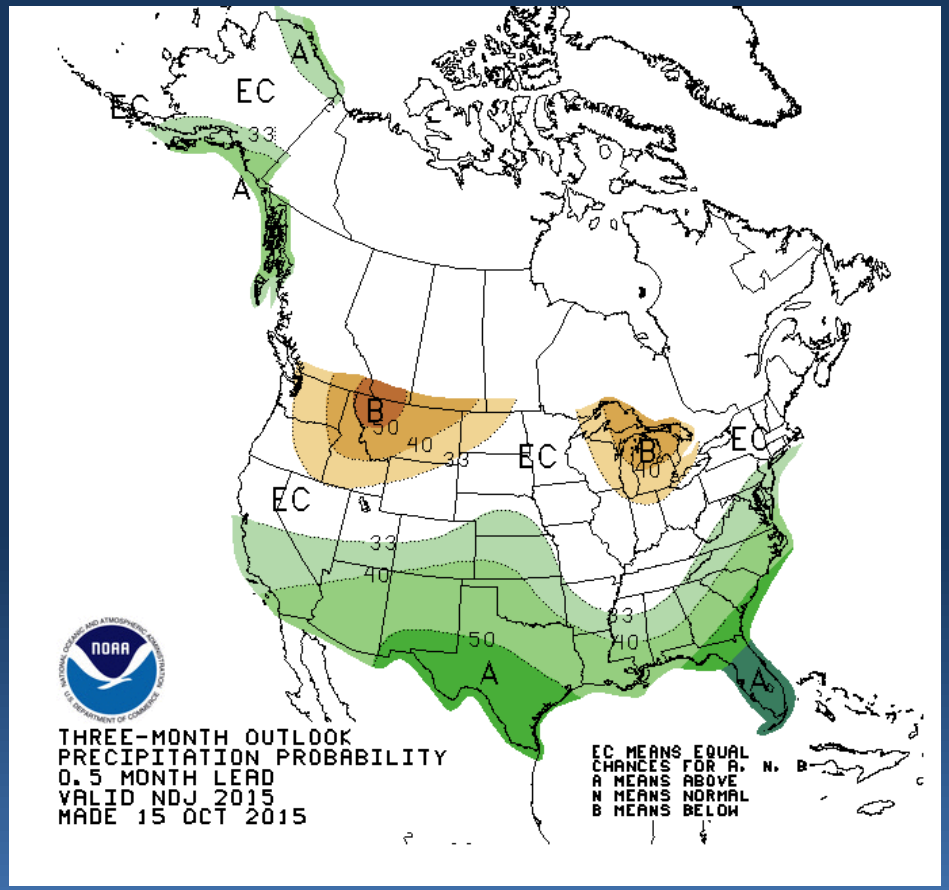
- Review of 2016 Water Supply Season
- Observed Conditions WY2017:
  - Precipitation
  - Temperature
  - Snowpack
  - Runoff
- Future Conditions:
  - 10 days of quantitative forecast precipitation (QPF)
  - 10 days of quantitative forecast temperature (QTF)
  - Historical climate forcings appended thereafter
  - Climate Outlook
- Modeling Changes, new products

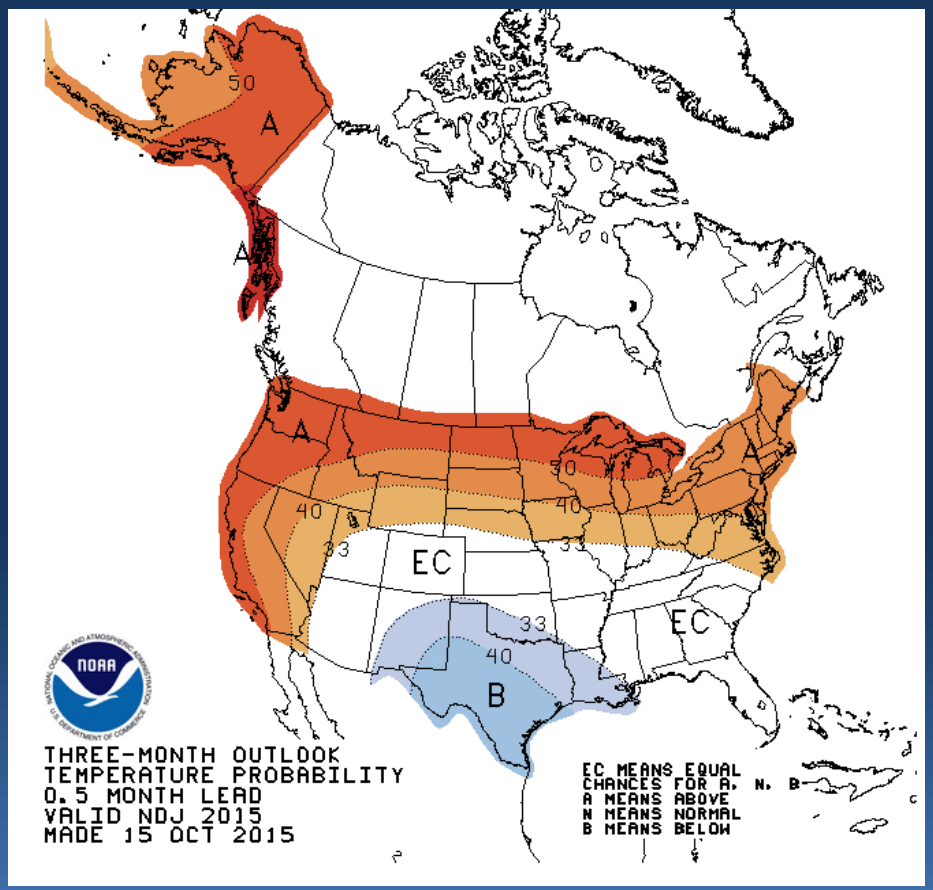
Hydrologic model states

Climate Forcings

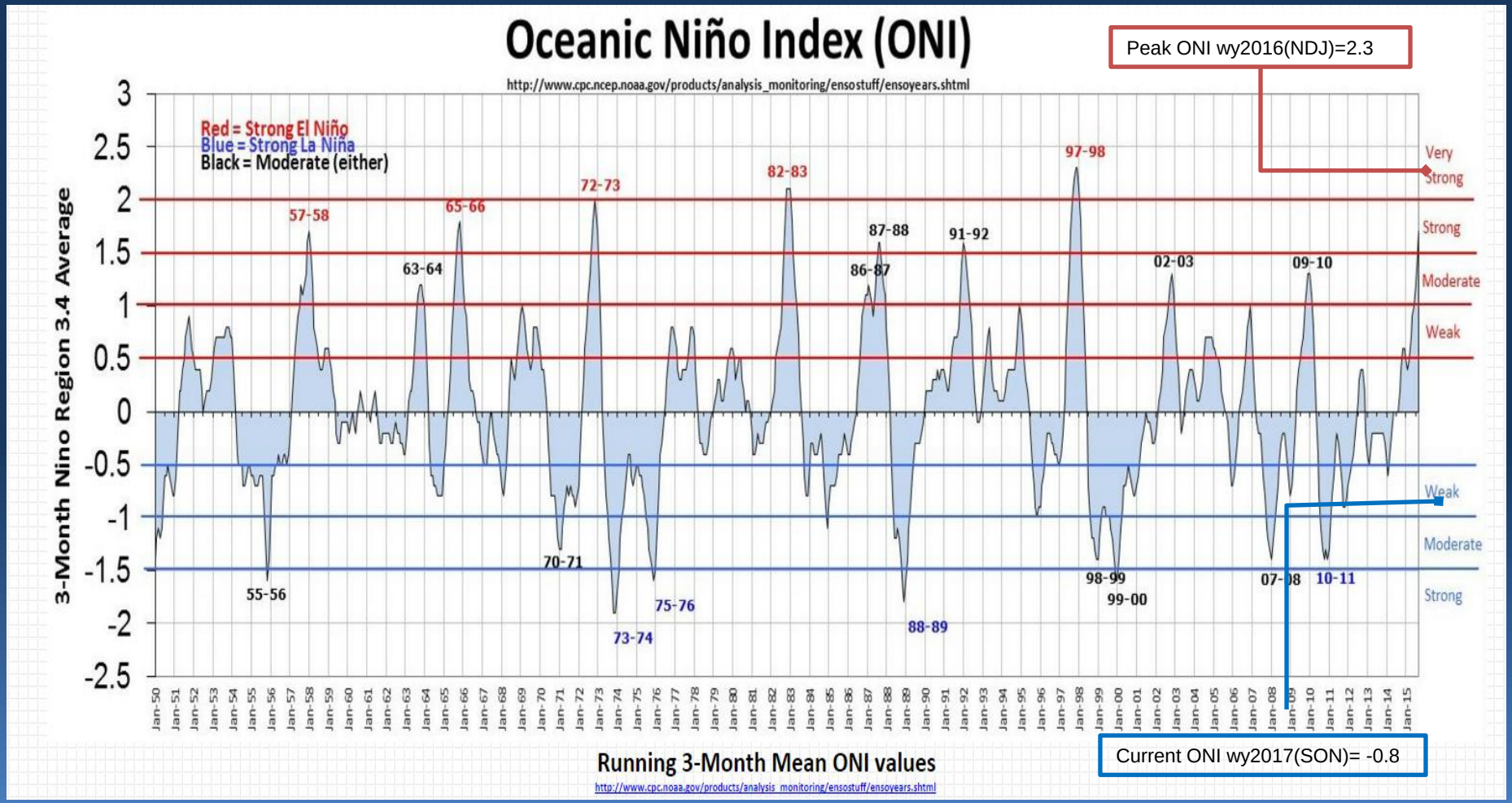
Climate Prediction Center

3 Month Seasonal Outlook issued 10/15/2015



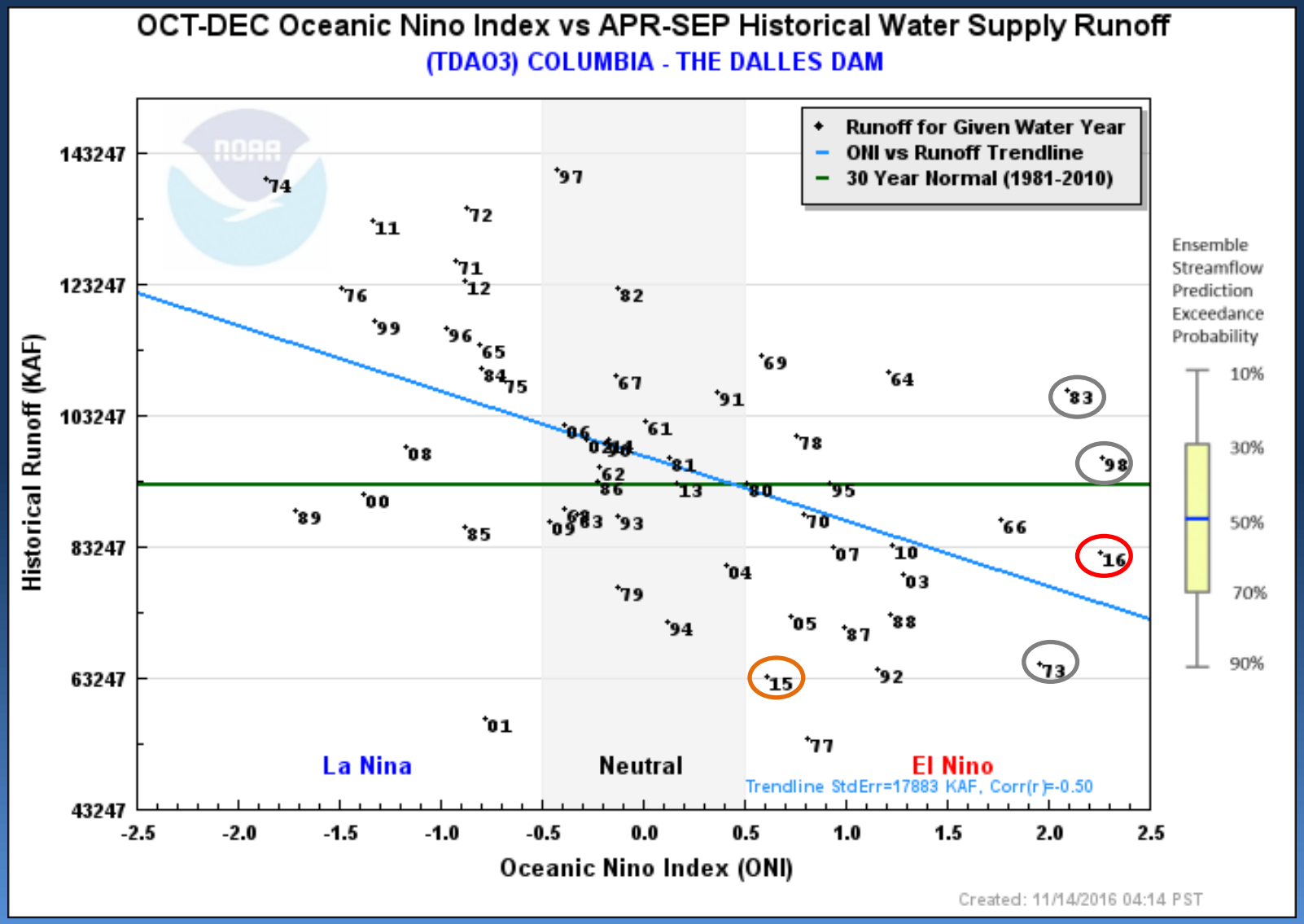


Oceanic Nino Index (ONI) values since 1950



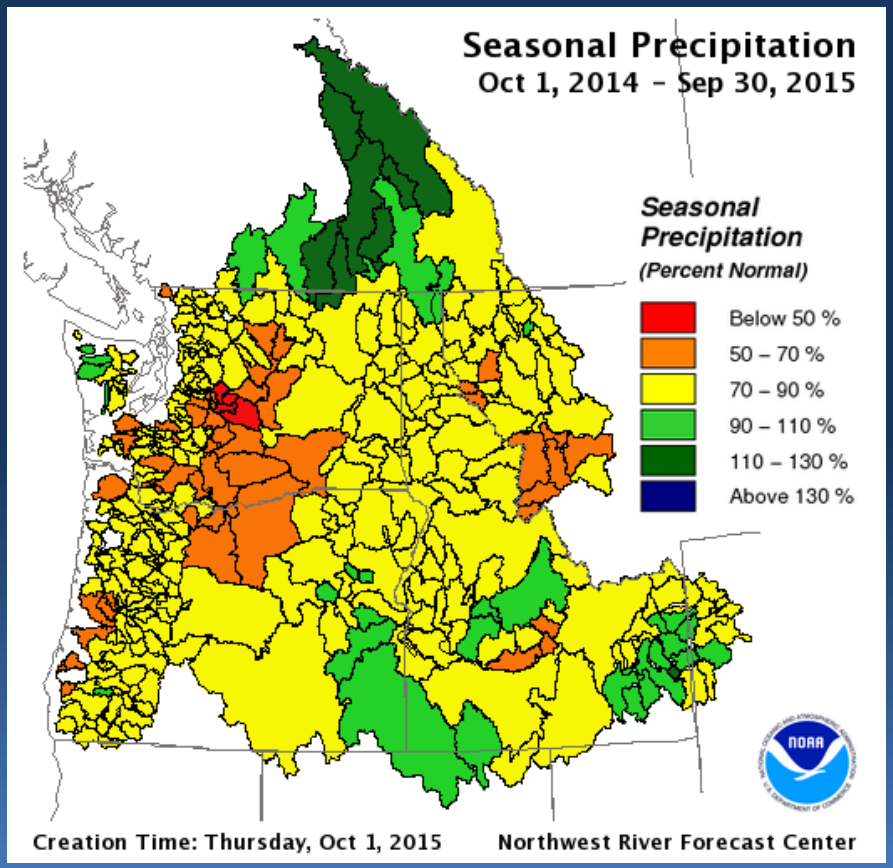
2016 Observed Runoff Volume

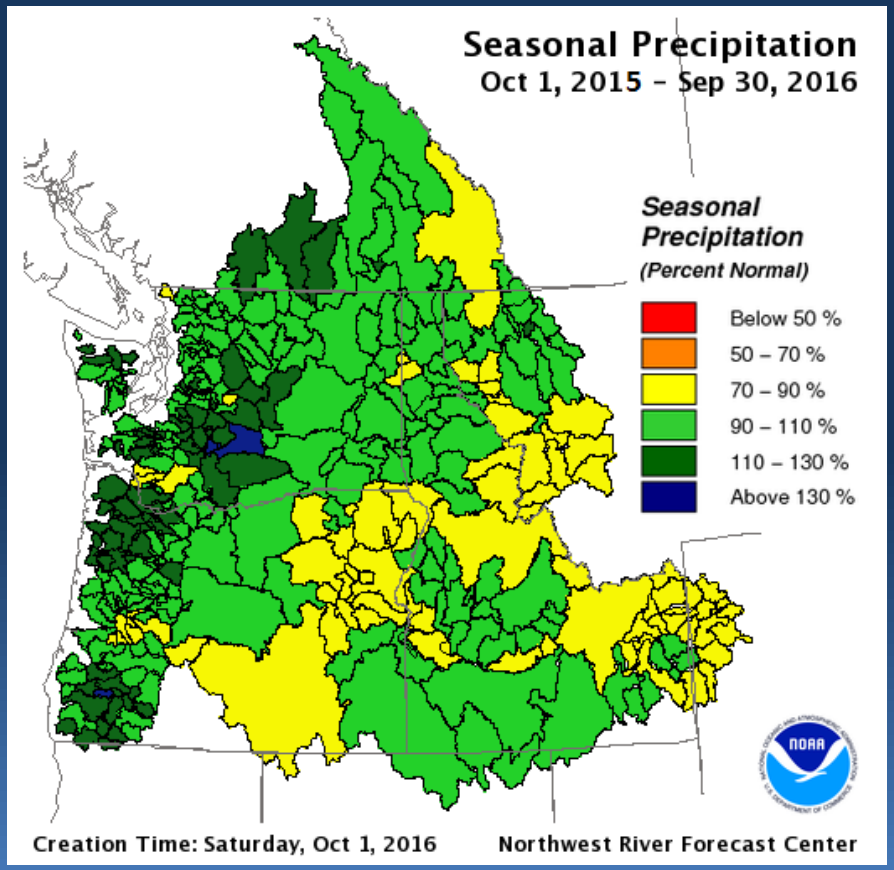
Historical ONI Perspective



Precipitation Summary

Water Year 2015 / 2016 comparison



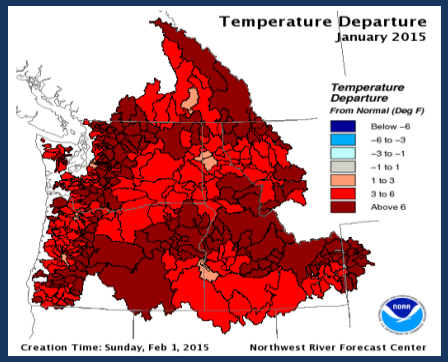


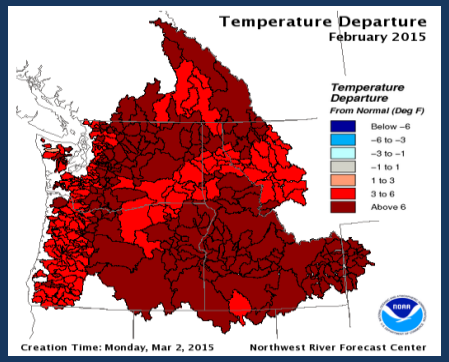
84% 95%

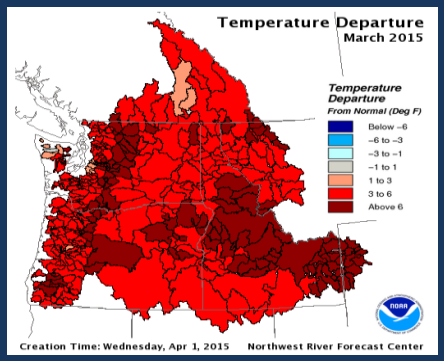
Columbia River Basin abv The Dalles

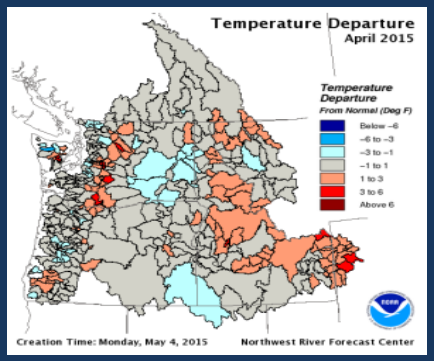
Monthly Temperature Departures from Normal

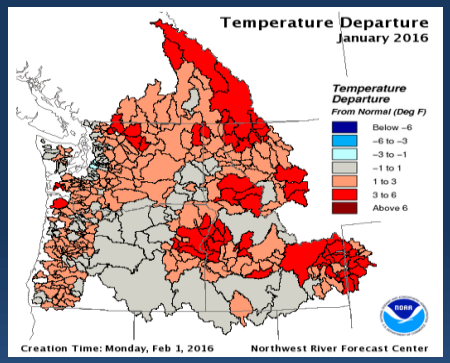
Water Year 2015 / 2016 comparison

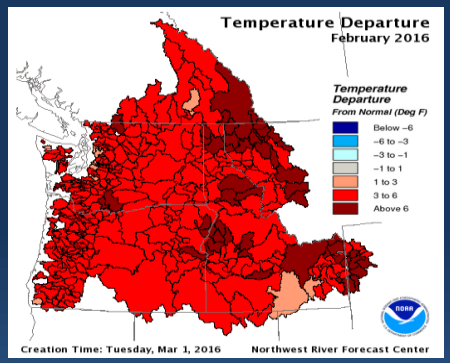


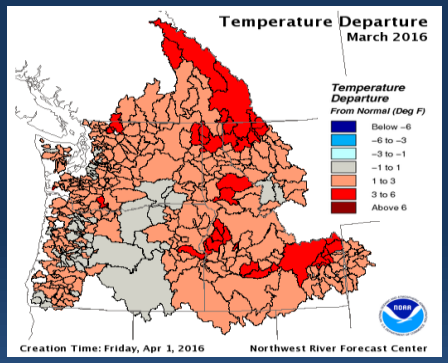


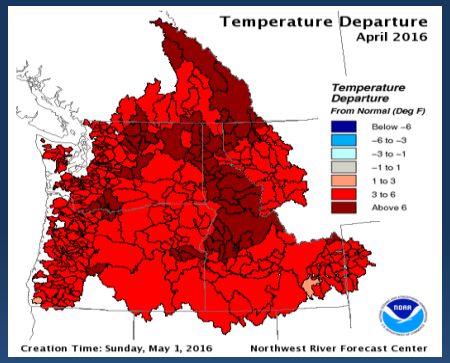










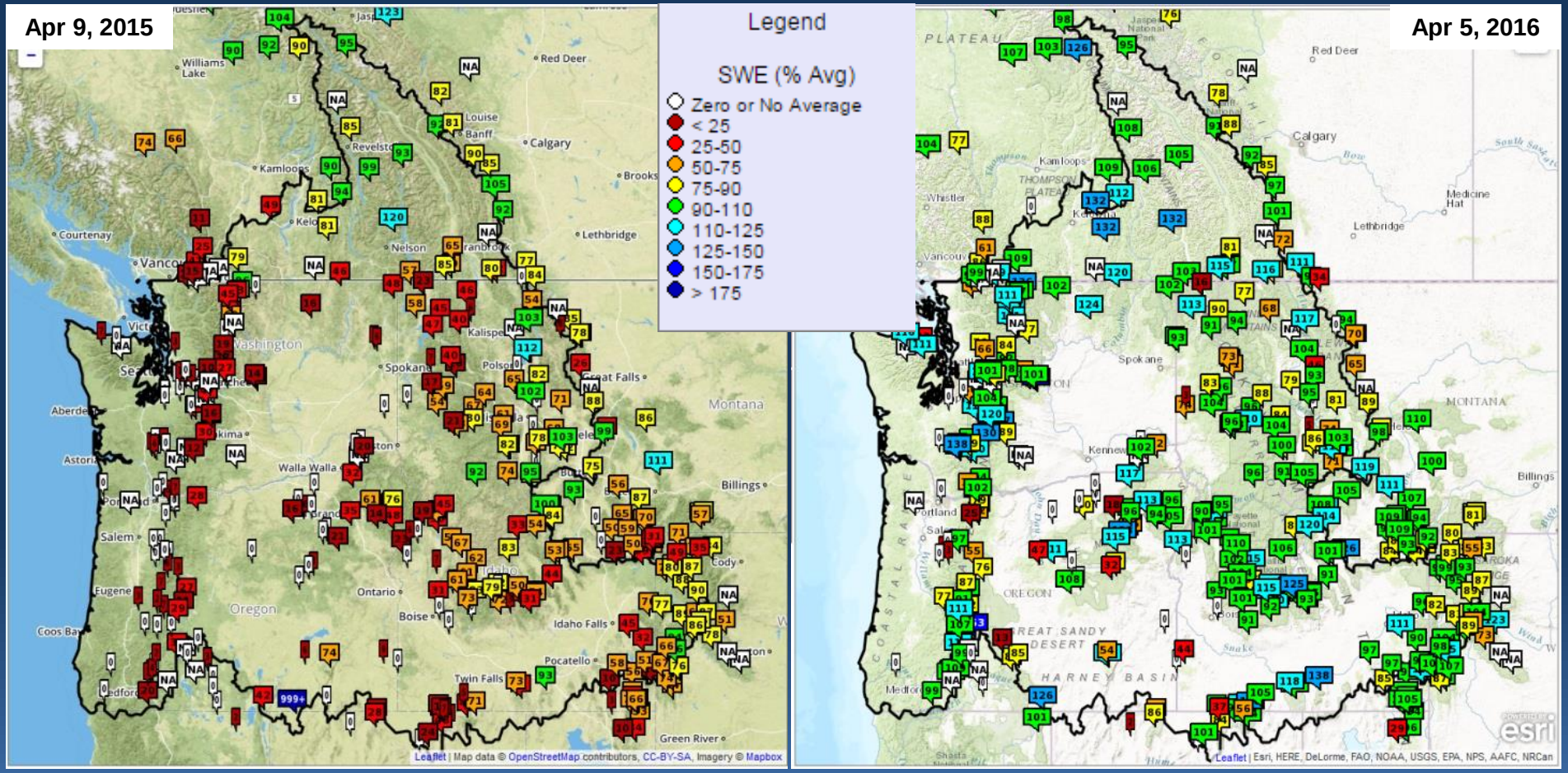


2016 Monthly Temperature Departure from Normal - DegF

DIVISION NAME	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Upper Snake River Basin abv American Falls Dam	5.8	-3.1	0.5	2	4.5	2.4	4.3	-0.1	3.6	-0.6	-0.4	-1.4
Clearwater River Basin	6.7	-1.3	1.5	2.8	6	2.5	6.8	2.9	3.4	0.3	1.6	0.2
Snake River Basin abv Ice Harbor Dam	6	-2.8	0.6	1.6	4.8	2.1	5.1	1	3.3	-0.6	0.4	-1
Flathead River Basin	4.2	-1.8	1.9	2.8	6.4	2.6	5.4	1.1	1.6	-1.5	-0.7	-1.5
Kootenai River Basin	4.9	-0.9	2.1	3.5	6.2	3.3	6.1	2.2	1.9	-0.8	0.8	-0.5
Columbia River Basin abv The Dalles	5.4	-2.1	1	2.1	5.2	2.3	5.5	1.6	2.4	-0.8	0.6	-1.1

Observed Snowpack Conditions

Water Year 2015 / 2016 comparison

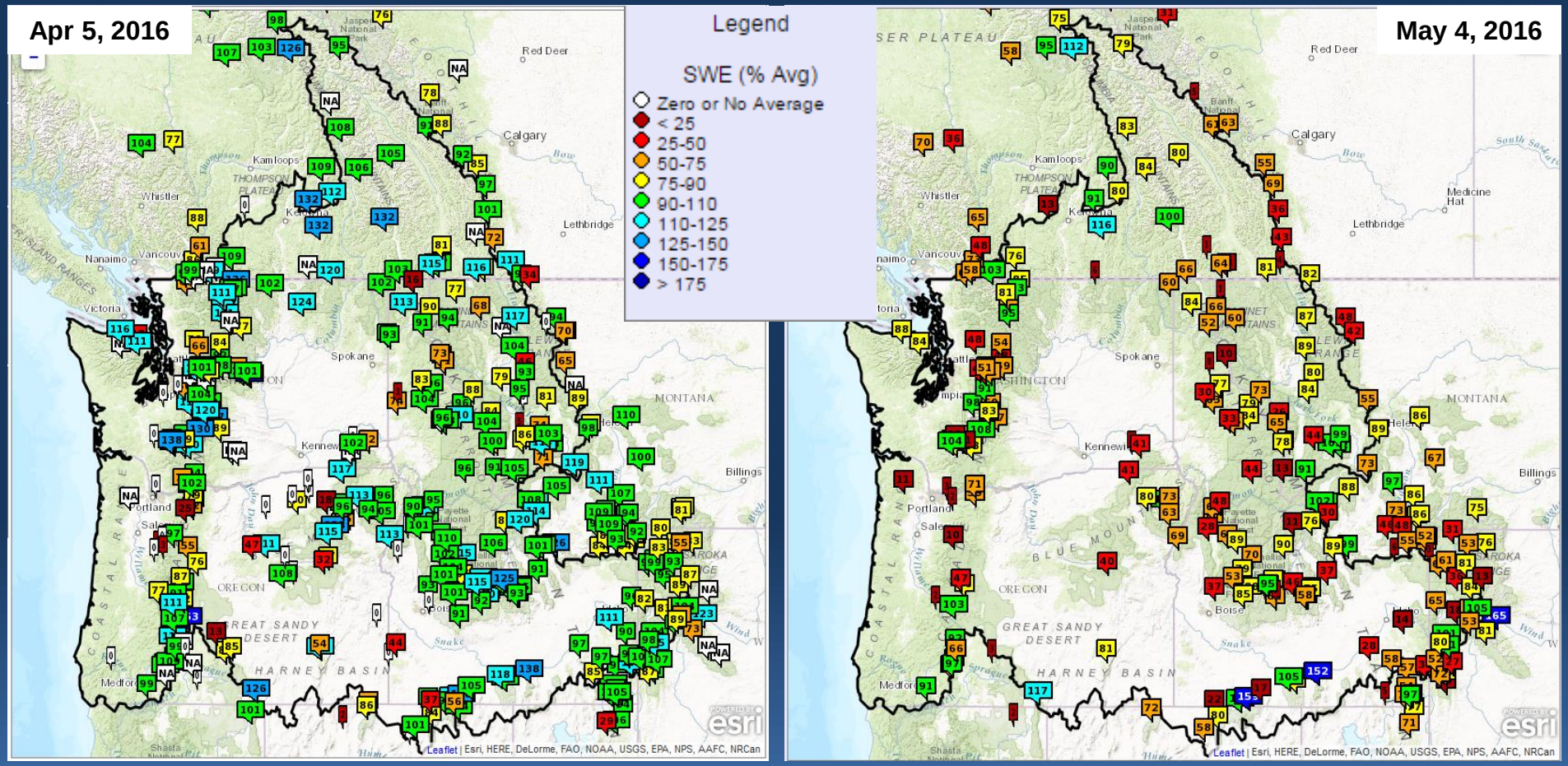


- Observed snow water equivalent (SWE) values provided by:
  - Natural Resources Conservation Service (NRCS) SNOTEL network
  - Environment Canada (EC) Automated Snow Pillow network

www.nwrfc.noaa.gov/snow

Observed Snowpack Conditions

April - May 2016 comparison



- Observed snow water equivalent (SWE) values provided by:
  - Natural Resources Conservation Service (NRCS) SNOTEL network
  - Environment Canada (EC) Automated Snow Pillow network

www.nwrfc.noaa.gov/snow

Observed Runoff Summary

Water Year 2015 / 2016 comparison – Eastside of Cascades

	2015 Oct –Sep	2015 Jan-Sep	2015 Apr-Sep	2016 Oct –Sep	2016 Jan-Sep	2016 Apr-Sep
MCDQ2 Mica Dam	109	107	104	101	98	97
LYDM8 Libby Dam	85	82	74	92	92	91
HHWM8 Hungry Horse	92	88	64	87	90	86
DWRI1 Dworshak	79	75	45	96	98	84
PALI1 Palisades	93	91	87	93	93	92
LGDW1 Lower Granite	73	69	56	86	87	83
TDAO3 The Dalles	86	82	69	94	94	89

Observed Runoff Summary

Water Year 2015 / 2016 comparison – Westside of Cascades

	2015 Oct –Sep	2015 Jan-Sep	2015 Apr-Sep	2016 Oct –Sep	2016 Jan-Sep	2016 Apr-Sep
CONW1 Skagit R at Concrete	103	88	64	114	107	91
MYDW1 Mayfield Res - Cowlitz	92	77	51	121	106	80
MEHO3 N Santiam at Mehama	83	63	50	103	95	69
SLMO3 Willamette R at Salem	79	62	52	103	94	66

Water Supply Forecast Briefing Outline

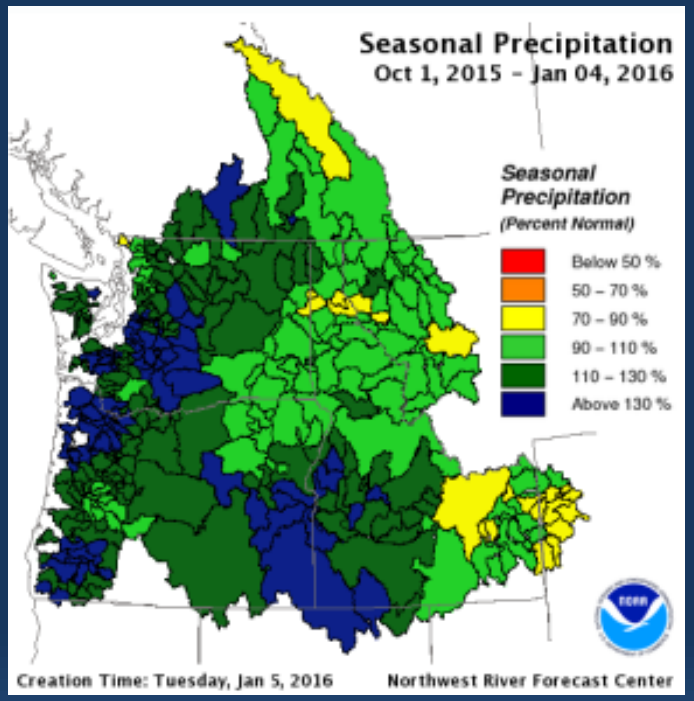
- Review of 2016 Water Supply Season
- Observed Conditions WY2017:
  - Precipitation
  - Temperature
  - Snowpack
  - Runoff
- Future Conditions:
  - 10 days of quantitative forecast precipitation (QPF)
  - 10 days of quantitative forecast temperature (QTF)
  - Historical climate forcings appended thereafter
  - Climate Outlook
- Modeling Changes, new products

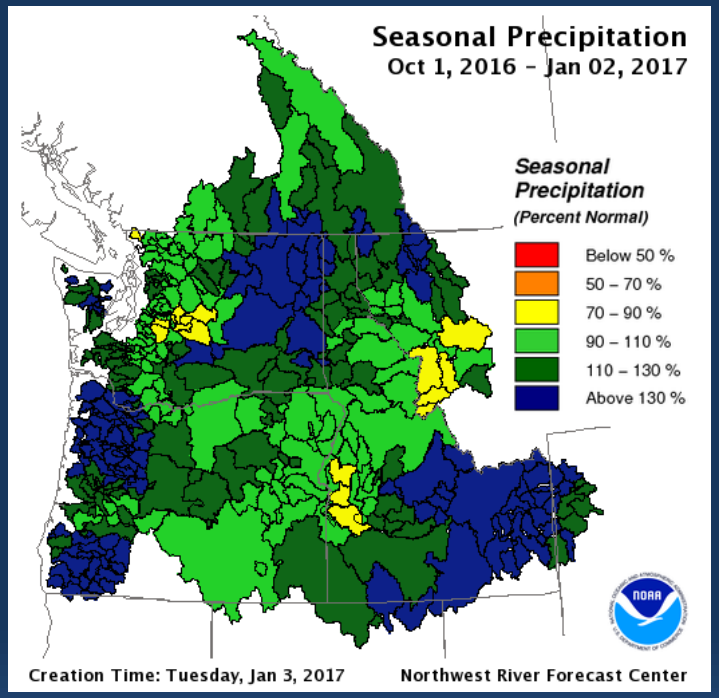
Hydrologic model states

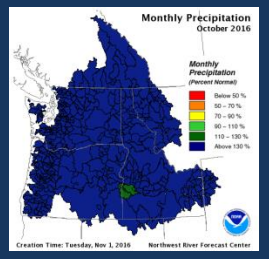
Climate Forcings

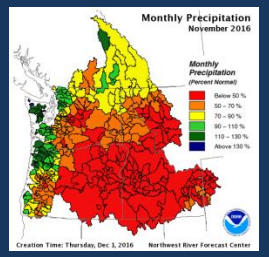
Observed Seasonal Precipitation

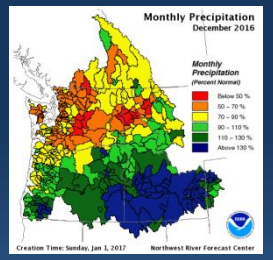
Water Year 2016 / 2017 Comparison







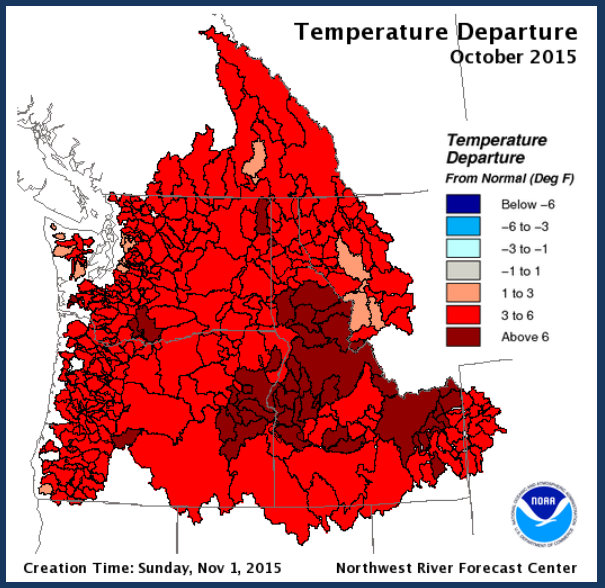


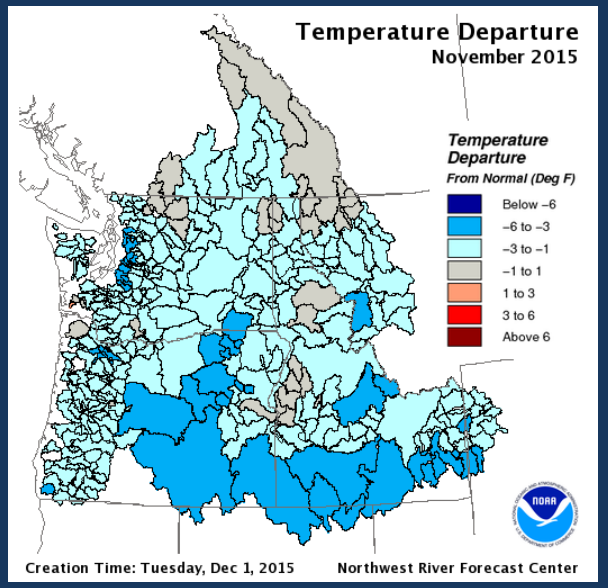


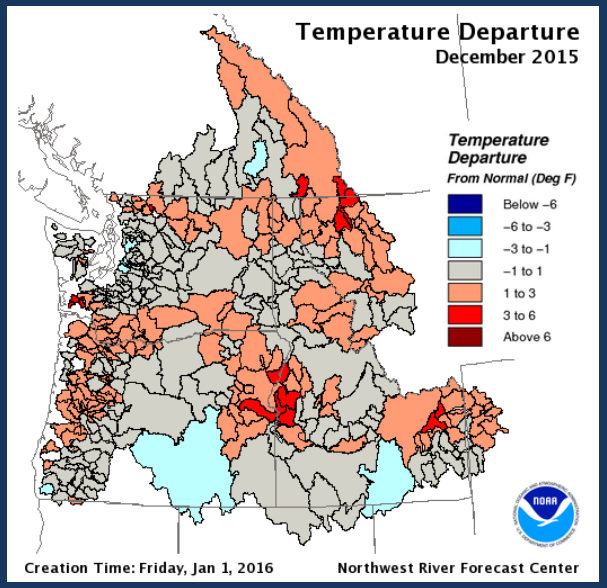
DIVISION NAME	WY 2016 % NORM	WY 2017 % NORM	WY 2017 OBS (in)
Columbia River Basin above Grand Coulee Dam	101	118	14.9
Snake River Basin above Ice Harbor Dam	110	117	8.2
Columbia River Basin above The Dalles Dam	108	114	10.5
*Western Washington	121	108	40.8
*Western Oregon	138	137	36.6

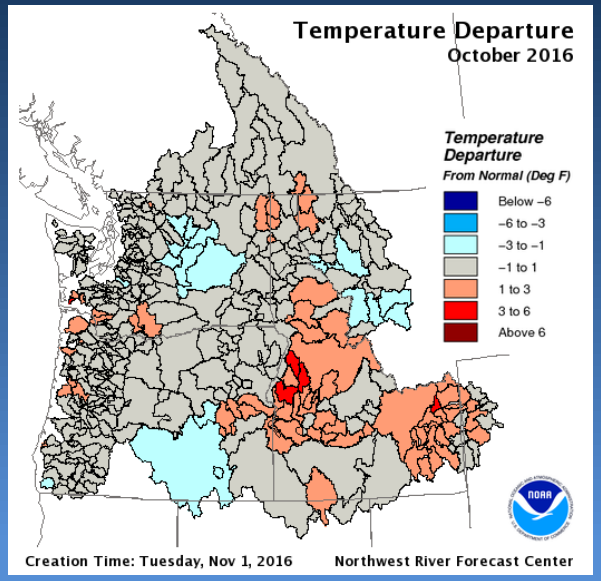
Monthly Temperature Departures from Normal

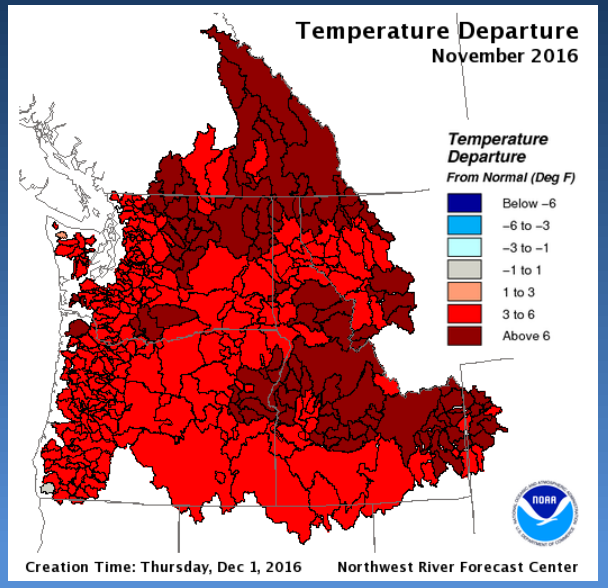
Water Year 2016 / 2017 comparison

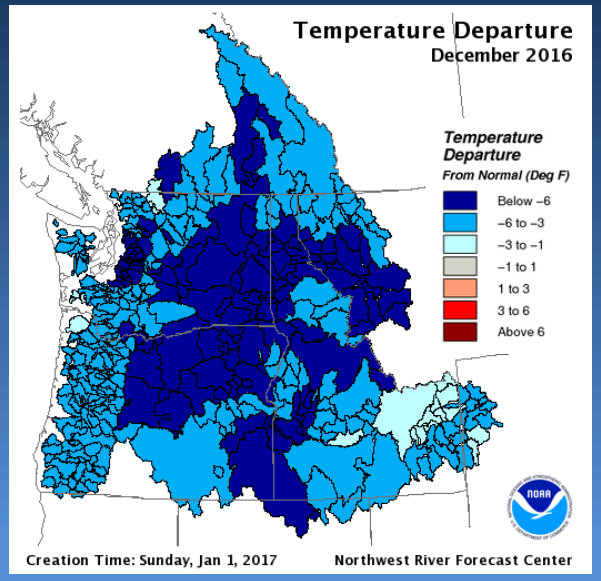






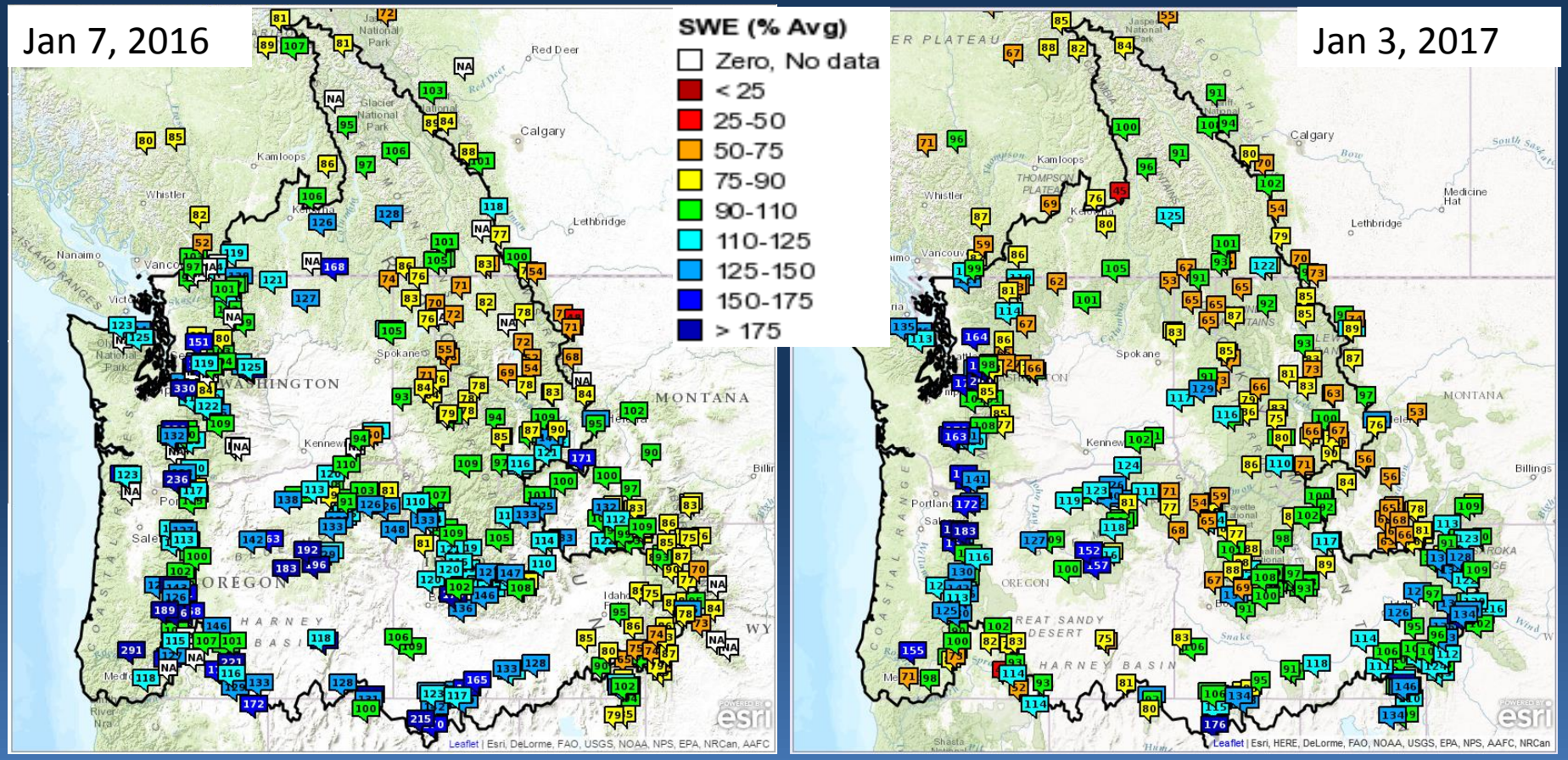






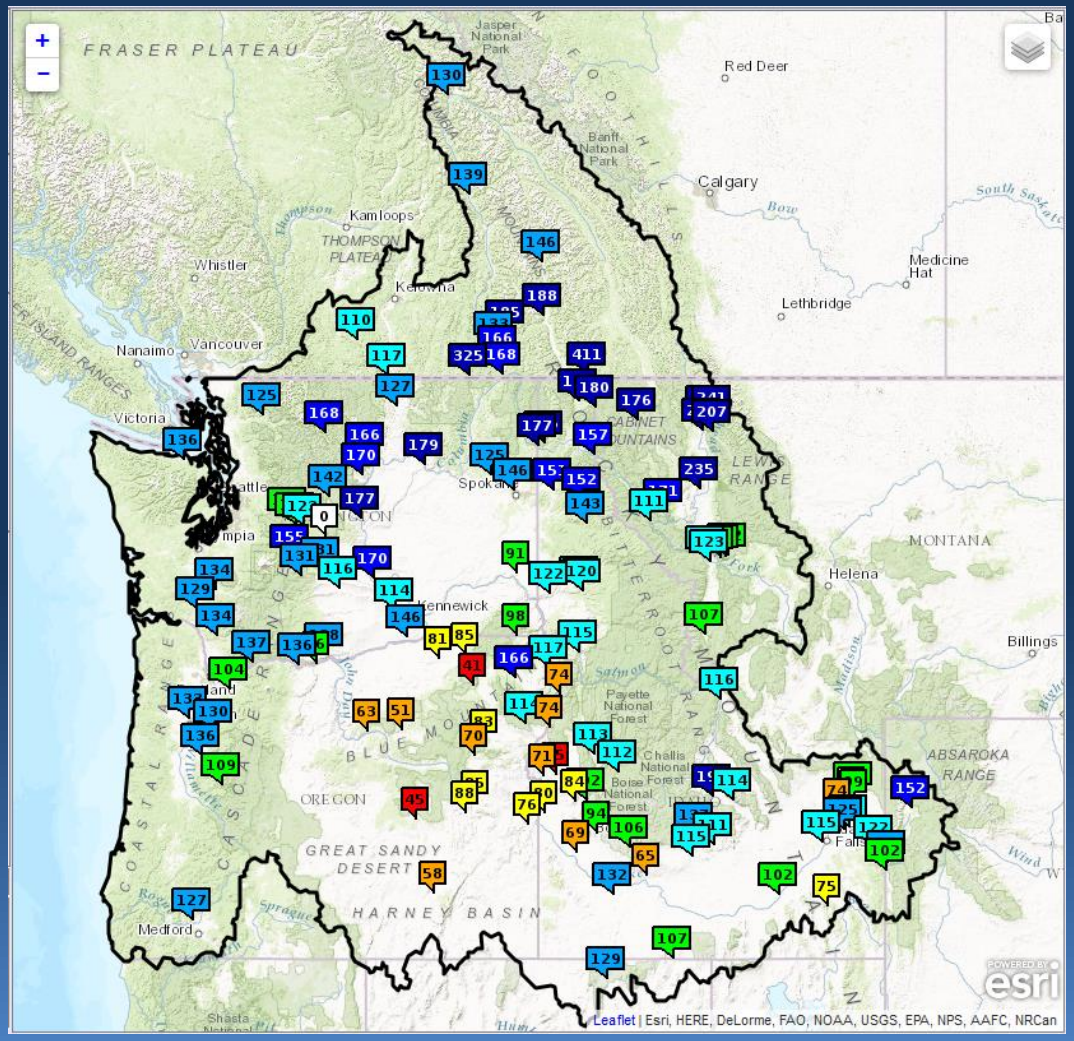
Snowpack Summary

Water Year 2016 / 2017 January Comparison



Current Adjusted Runoff Conditions

Water Year 2017



Percent of Normal

Oct 1– Jan 2

UPPER COLUMBIA BASIN	
MICA	130
DUNCAN	144
QUEENS BAY	187
LIBBY	151
HUNGRY HORSE	208
GRAND COULEE	
SNAKE RIVER BASIN	
JACKSON LAKE	152
PALISADES	123
DWORSHAK	123
LOWER COLUMBIA BASIN	
THE DALLES	136

Water Supply Forecast Briefing Outline

- Review of 2016 Water Supply Season
- Observed Conditions WY2017:
  - Precipitation
  - Temperature
  - Snowpack
  - Runoff

Hydrologic model states

- Future Conditions:
  - 10 days of quantitative forecast precipitation (QPF)
  - 10 days of quantitative forecast temperature (QTF)
  - Historical climate forcings appended thereafter
  - Climate Outlook

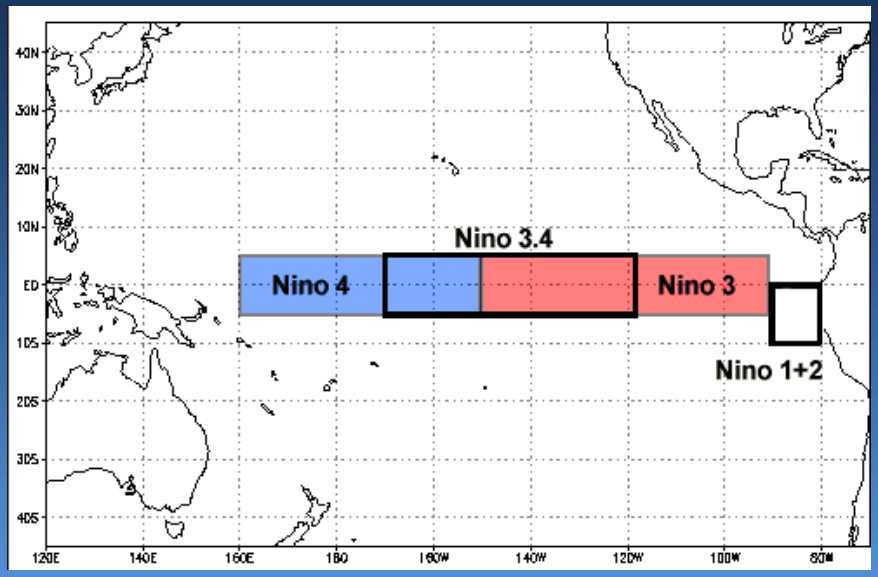
Climate Forcings

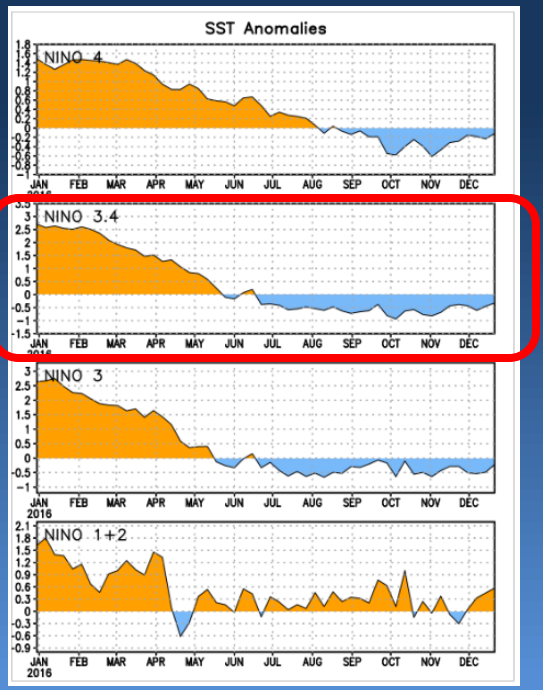
- Modeling Changes, new products

Current ENSO Discussion

ENSO Alert Status: La Nina Advisory

- Below average sea surface temperature (SST) anomalies in central and eastern Pacific Ocean
- Transition to ENSO-neutral is favored during Jan-Mar 2017





IRI/CPC Plume Forecast

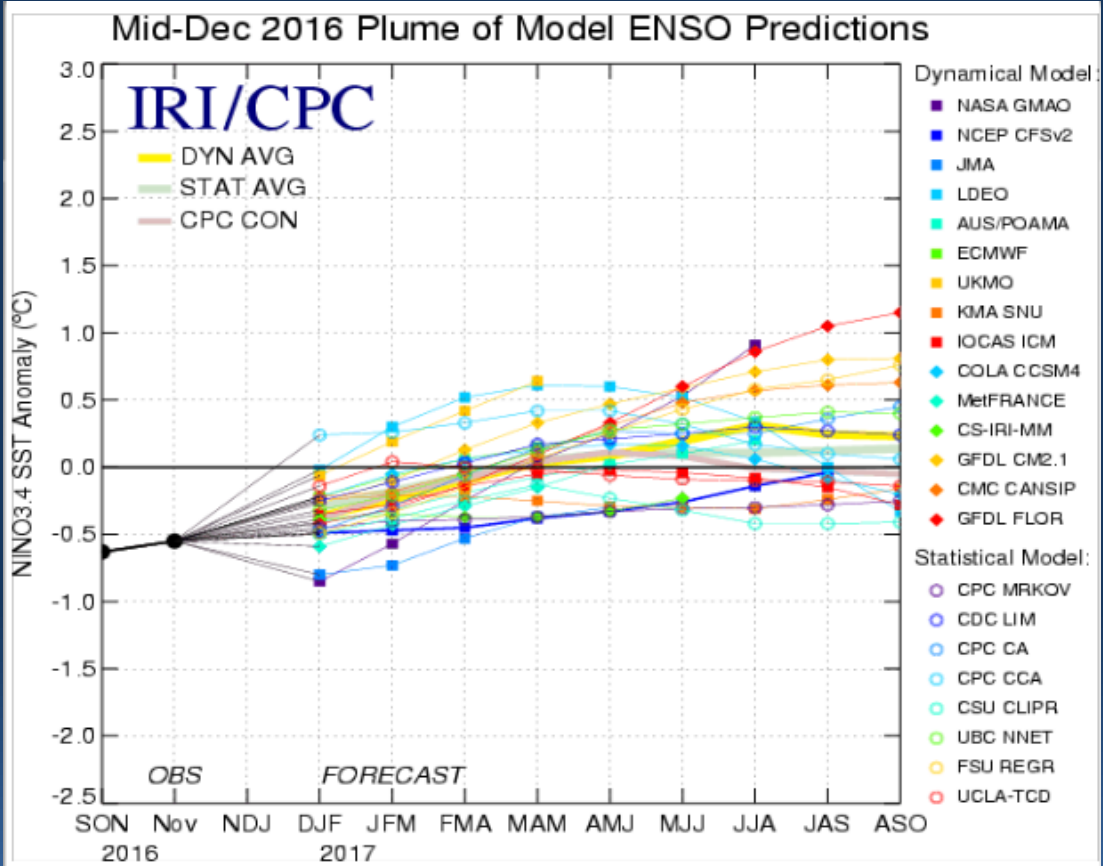


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 13 December 2016).

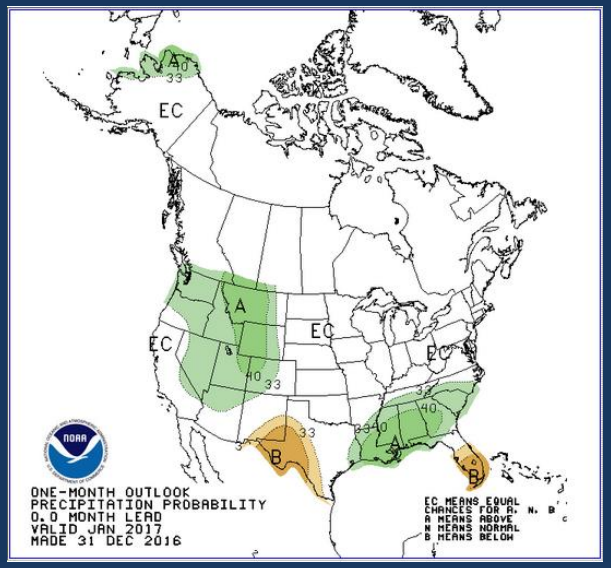
- Multi-model averages indicate a transition to ENSO-neutral during the Northern Hemisphere winter 2016-17.

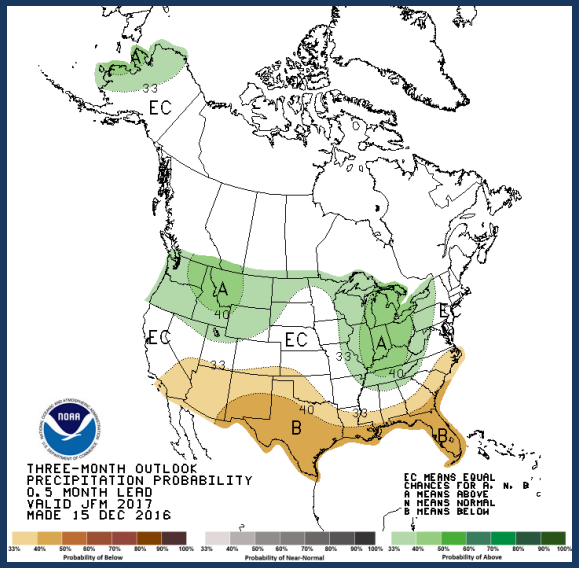
CPC Climate Outlook

Current Month Outlook

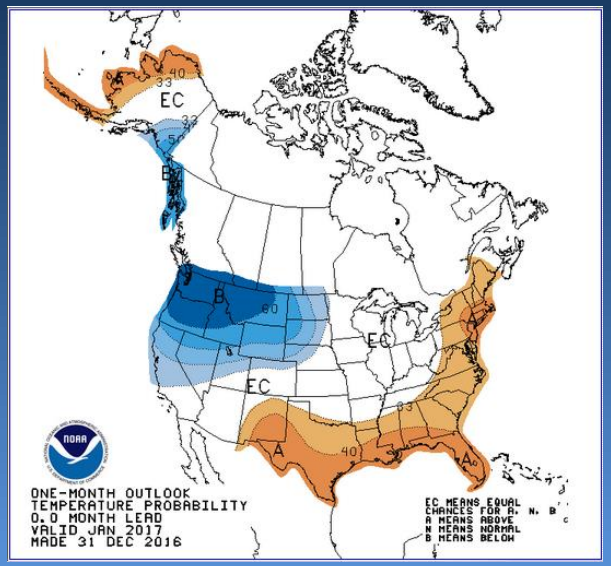
Three Month Outlook

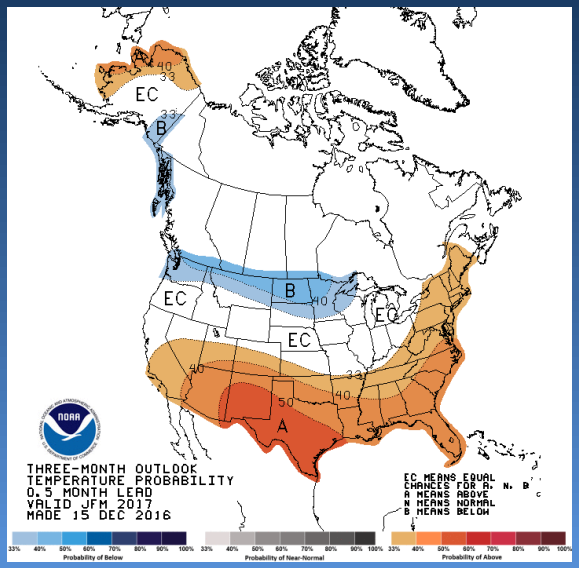
Precipitation





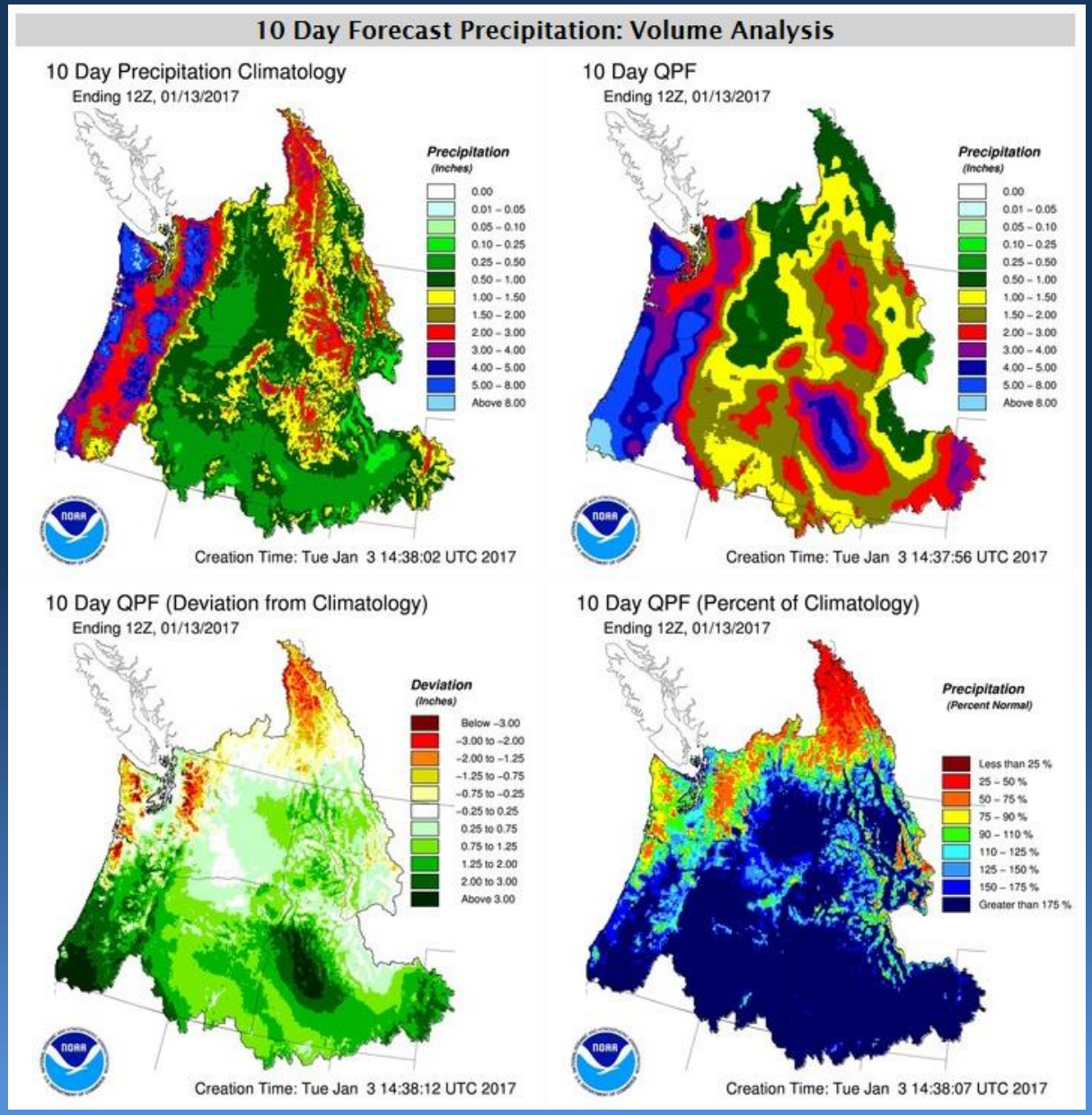
Temperature





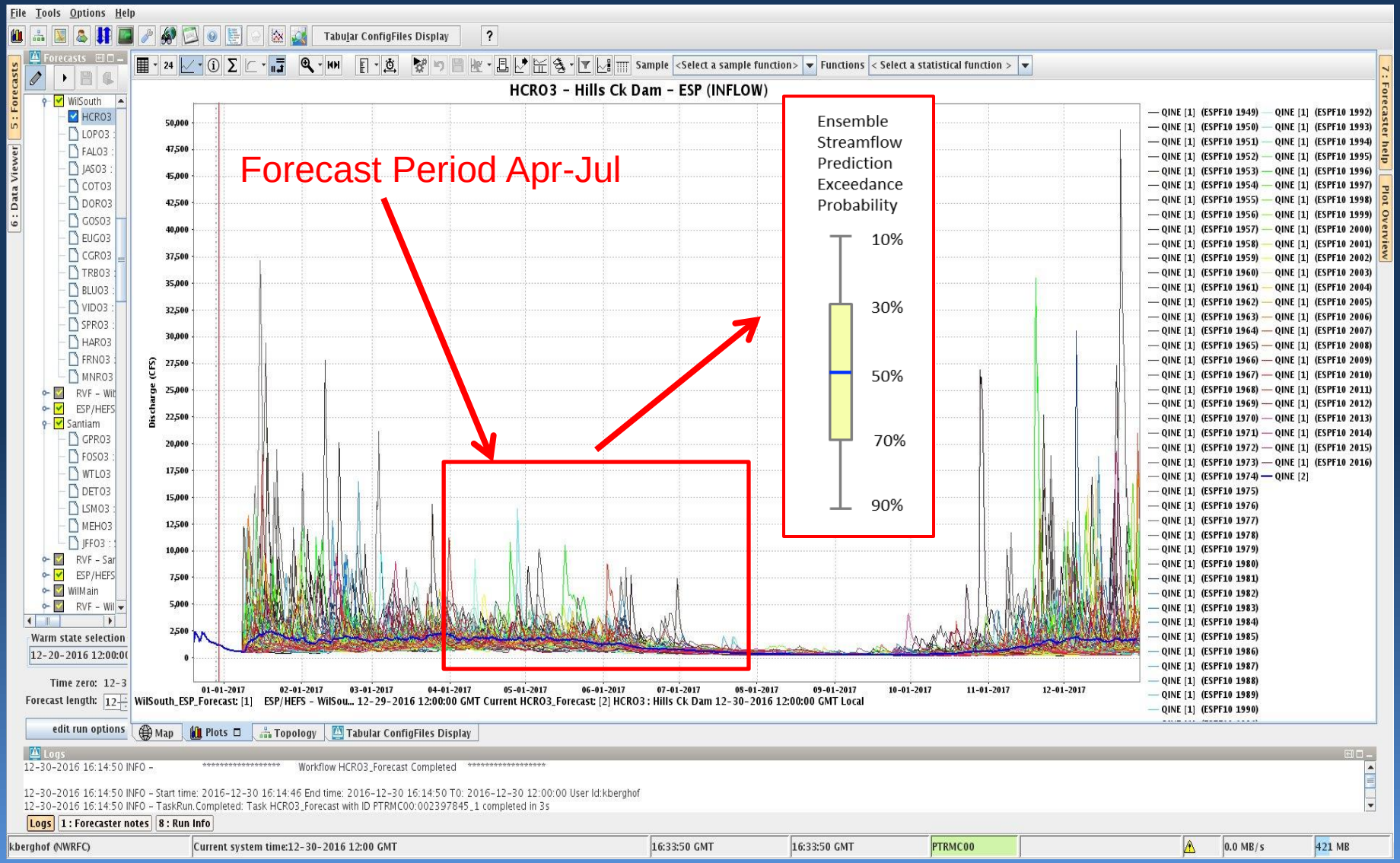
Cumulative 10 Day Precipitation

1/3/2017 – 1/13/2017



Statistical Summary of ESP Water Supply

Ensemble Traces Conveyed as Volume Exceedance Probabilities



NWRFC Water Supply Product

Columbia River at The Dalles

COLUMBIA - THE DALLES DAM (TDAO3)
Forecasts for Water Year 2017

Official Forecast

10 days QPF: ***Ensemble:*** 2017-01-04 ***Issued:*** 2017-01-04

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	77636	92629	100	105992	92704
APR-JUL	65922	78909	99	91705	79855
APR-AUG	72797	87285	100	99950	87532
JAN-SEP	95340	113029	99	127750	114216
JAN-JUL	84815	100186	99	115481	101368
OCT-SEP	117751	135440	104	150161	130518

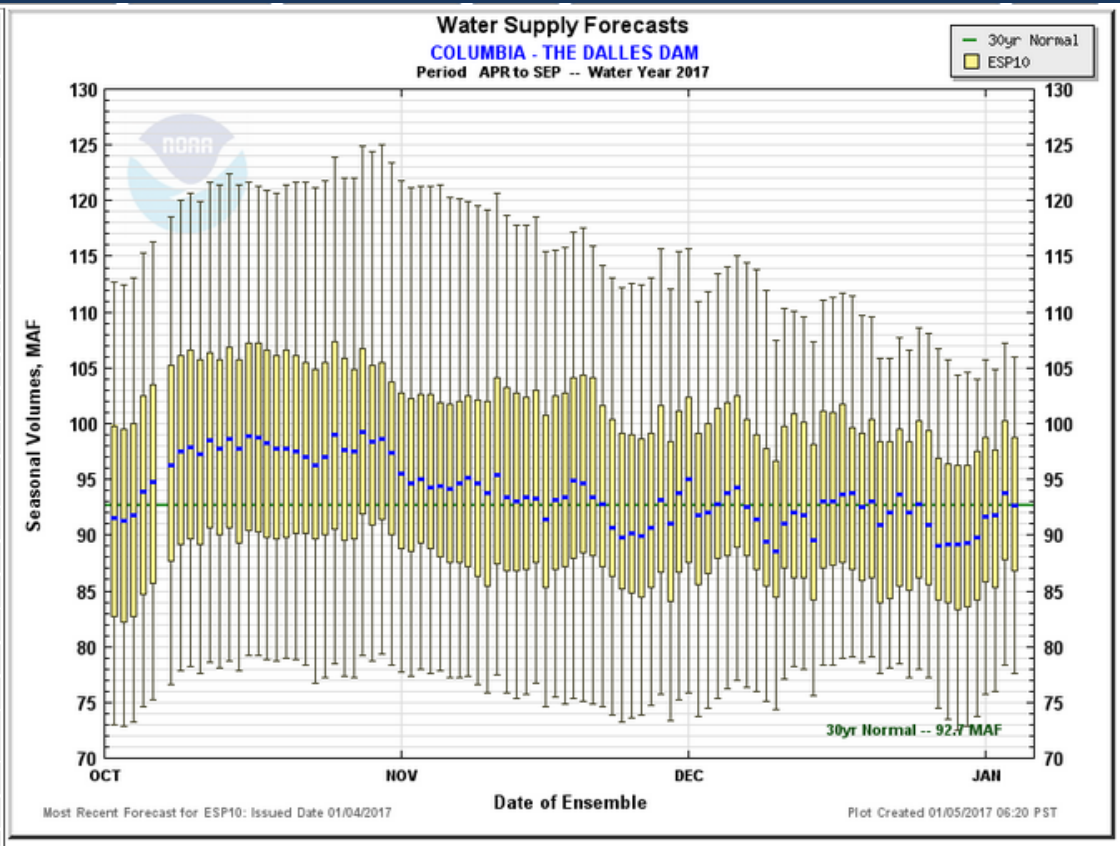
5 days QPF: ***Ensemble:*** 2017-01-04 ***Issued:*** 2017-01-04

APR-SEP	73914	90596	98	105785	92704
APR-JUL	63117	76863	96	90654	79855
APR-AUG	69557	85153	97	97986	87532
JAN-SEP	93271	109116	96	128288	114216
JAN-JUL	82083	96379	95	113725	101368
OCT-SEP	115683	131527	101	150699	130518

0 days QPF: ***Ensemble:*** 2017-01-04 ***Issued:*** 2017-01-04

APR-SEP	77080	91939	99	107624	92704
APR-JUL	66066	77488	97	92265	79855
APR-AUG	72762	86196	98	101751	87532
JAN-SEP	96480	112145	98	130115	114216
JAN-JUL	85854	98740	97	115360	101368
OCT-SEP	118891	134556	103	152526	130518

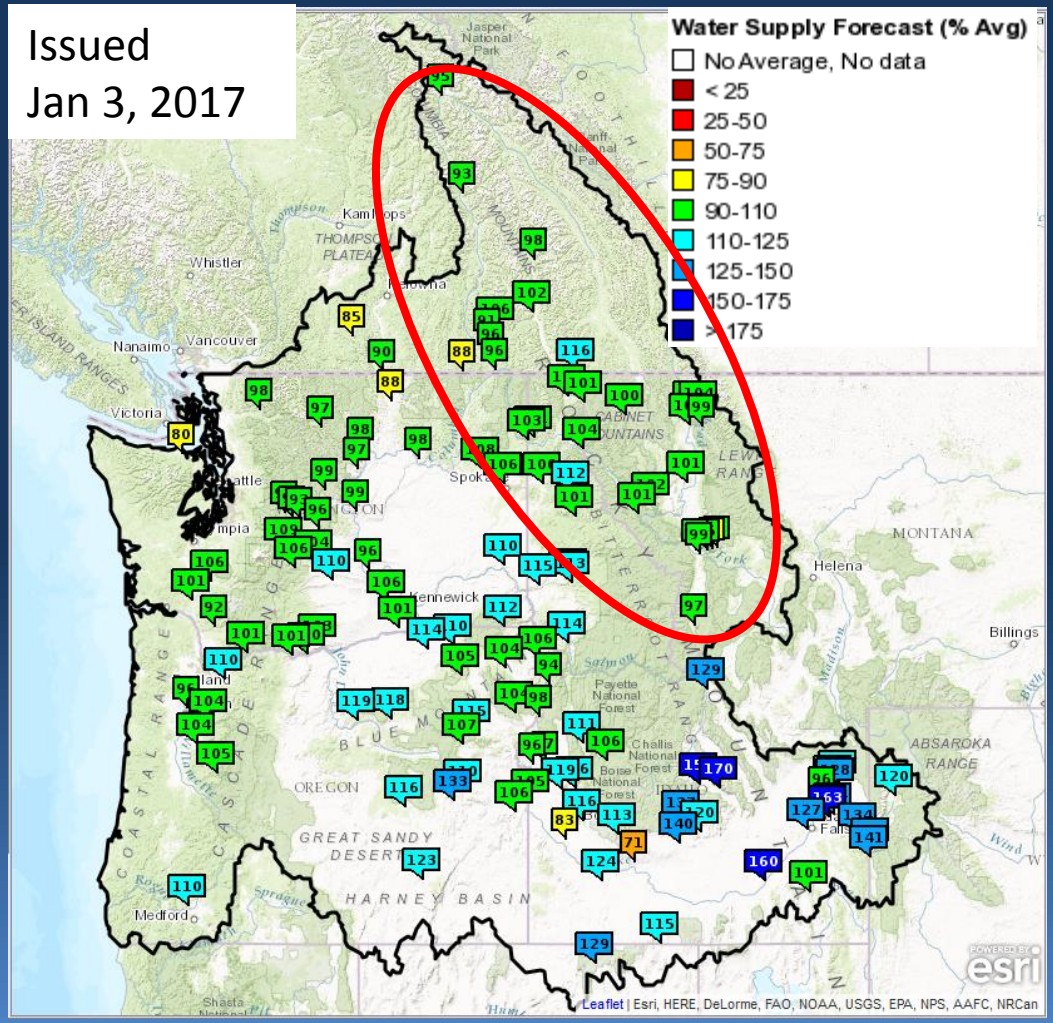
Move the mouse over the desired "Forecast Period" to display a graph.



Water Supply Forecasts

Upper Columbia Basin

Issued
Jan 3, 2017



Jan 2017 Apr – Sep Forecast

Kootenai River
- Libby Dam 100%

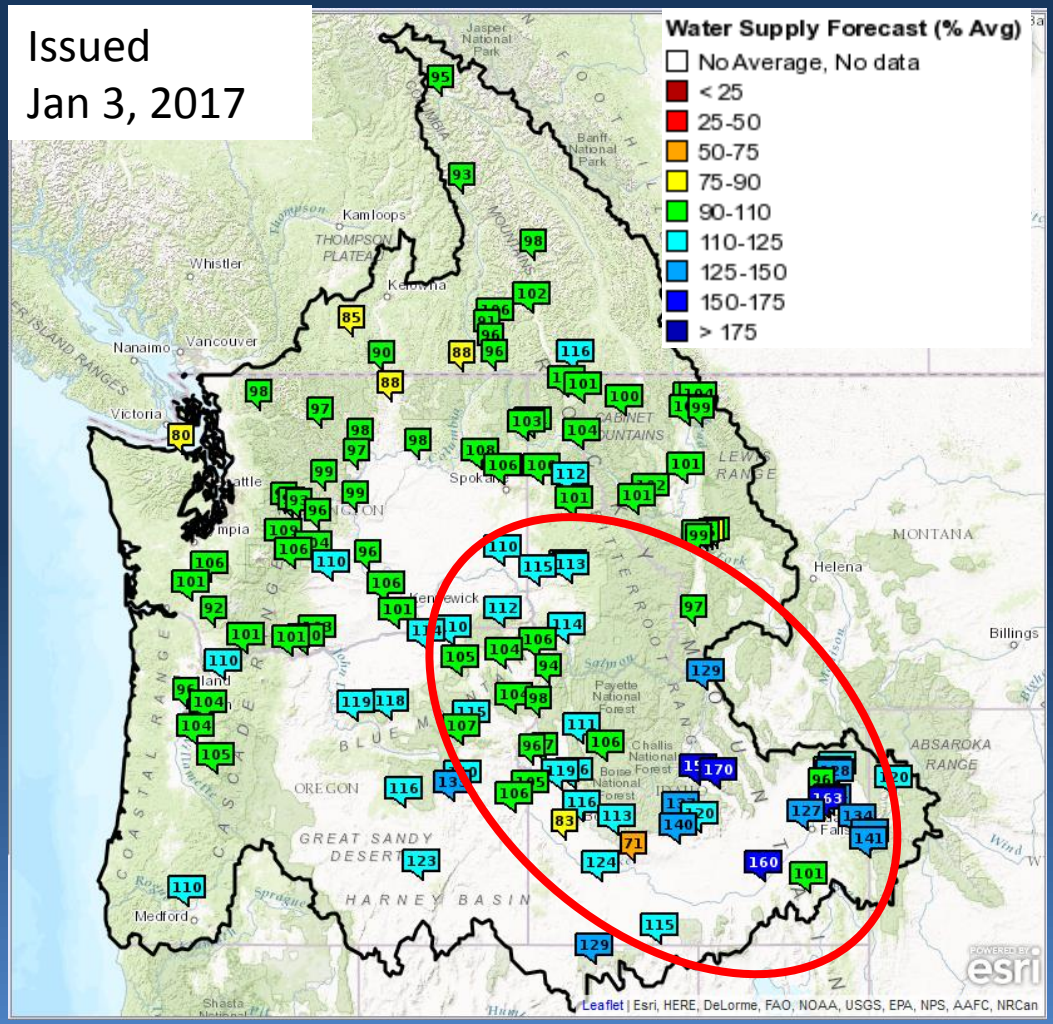
Coeur d'Alene River
- Coeur d'Alene Lake 106%

SF Flathead River
- Hungry Horse Dam 99%

Columbia River
- Grand Coulee Dam 98%

Water Supply Forecasts

Snake River Basin and Columbia Mainstem

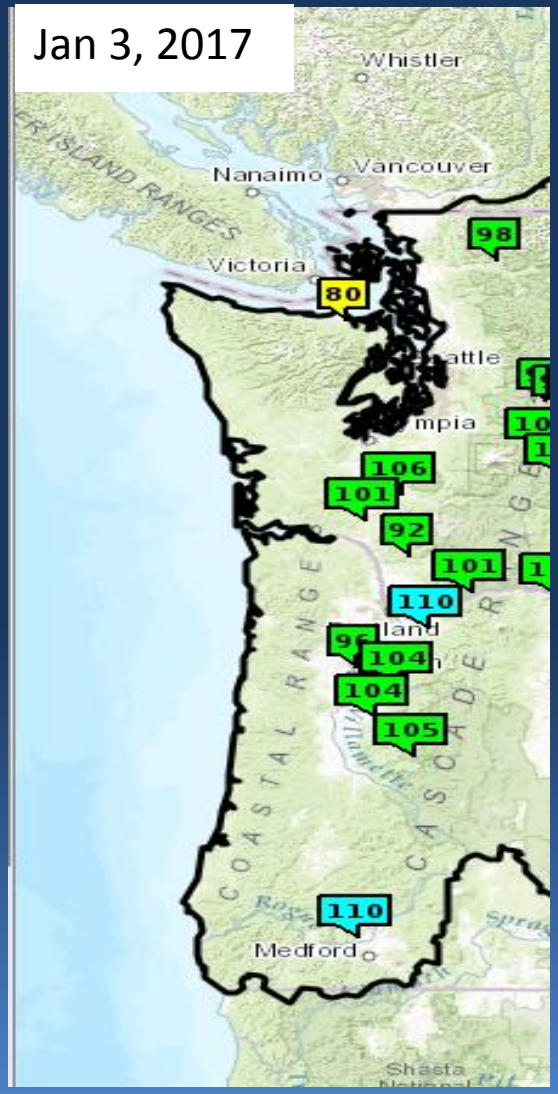


Jan 2017 Apr – Sep Forecast

Upper Snake River - Jackson Lake Dam	120%
Upper Snake River - Palisades Dam	134%
NF Clearwater River - Dworshak Dam	113%
Lower Snake River - Lower Granite Dam	110%
Lower Columbia - The Dalles Dam	101%

Water Supply Forecasts

Western Oregon and Washington Cascades



Jan 2016 Apr – Sep Forecast

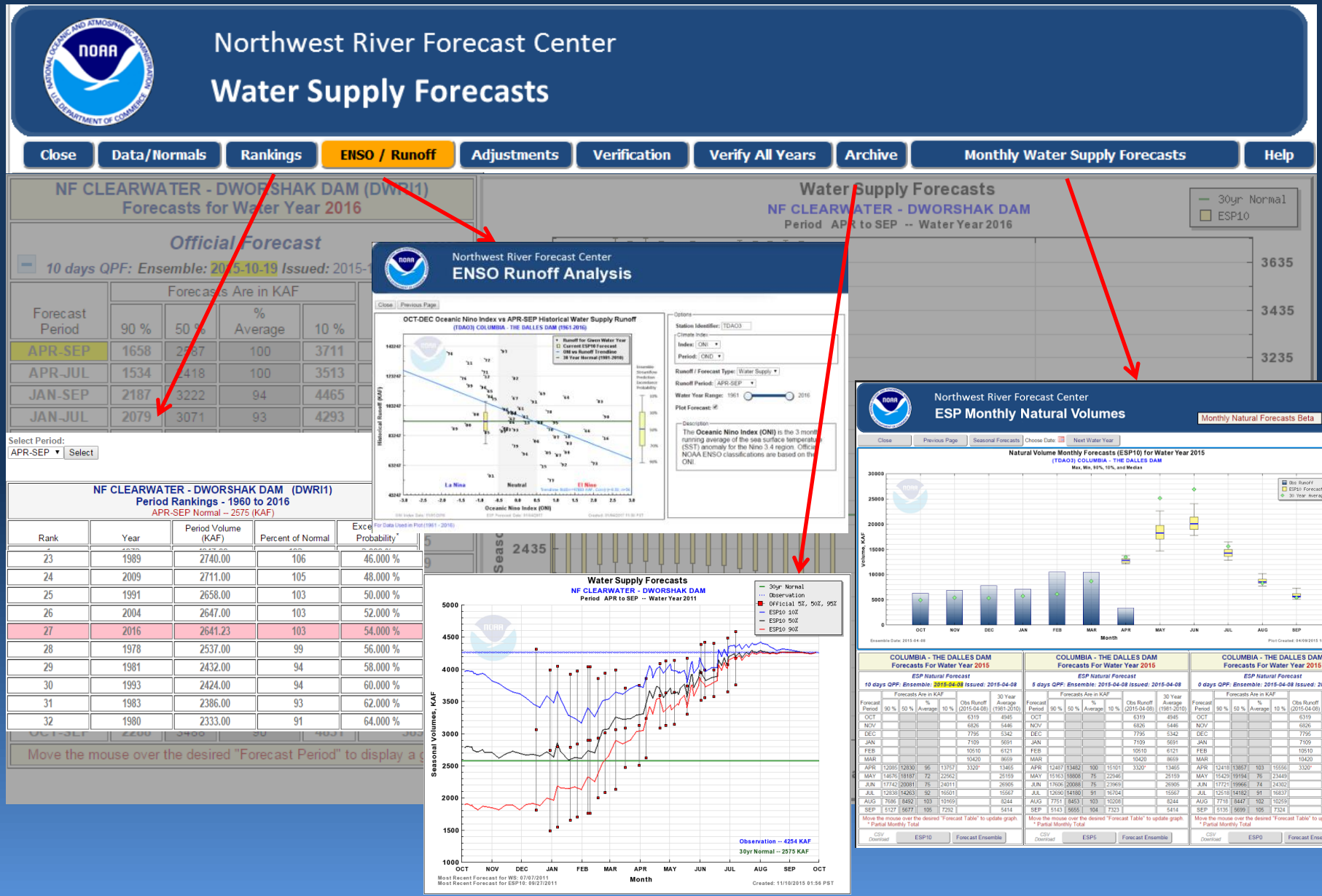
Skagit River
- near Concrete 98%

Cowlitz River
- Mayfield Reservoir 106%

North Santiam
- At Mehama 104%

Willamette River
- At Salem 96%

2017 ESP Volume Forecast Products



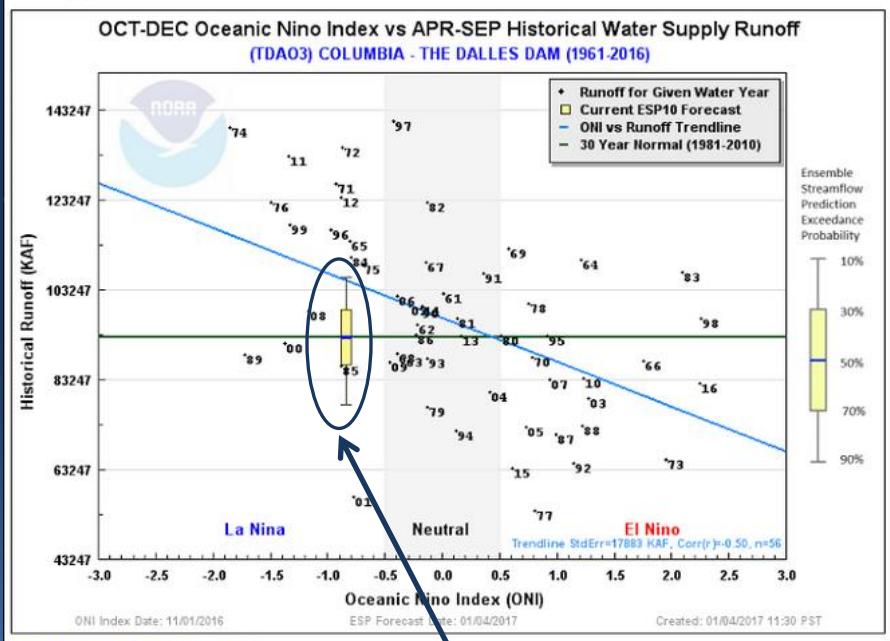
2017 ENSO Runoff Analysis

Available mid to late Jan 2017

Northwest River Forecast Center

ENSO Runoff Analysis

Close | Previous Page



For Data Used in Plot (1961 - 2016)

Options

Station Identifier: TDAO3

Climate Index

Index: ONI

Period: OND

Runoff / Forecast Type: Water Supply

Runoff Period: APR-SEP

Water Year Range: 1961 – 2016

Plot Forecast:

Description

The **Oceanic Nino Index (ONI)** is the 3 month running average of the sea surface temperature (SST) anomaly for the Nino 3.4 region. Official NOAA ENSO classifications are based on the ONI.

Climate Index Description

The **Multivariate ENSO Index (MEI)** is determined as the first principal component of six different parameters: sea level pressure, zonal and meridional components of the surface wind, sea surface temperature, surface air temperature and cloudiness.

The **North Atlantic Oscillation (NAO)** is a large scale fluctuation in atmospheric mass between the subtropical high and the polar low. The corresponding index varies from year to year, but also exhibits a tendency to remain in one phase for multi-year periods.

The **Oceanic Nino Index (ONI)** is the 3 month running average of the sea surface temperature (SST) anomaly for the Nino 3.4 region. Official NOAA ENSO classifications are based on the ONI.

The **Pacific Decadal Oscillation (PDO)** is a measure of surface water temperature in the Pacific Ocean north of 20° N. During a positive (warm) phase, the west Pacific becomes cooler and part of the eastern ocean warms; the opposite pattern occurs during a negative (cool) phase.

The **Southern Oscillation Index (SOI)** is based on observed sea level pressure differences between Tahiti and Darwin, Australia. The SOI is expressed as an departure from the 1981-2010 base period.

3 Month Average

OND: Oct - Dec

NDJ: Nov - Jan

DJF: Dec - Feb

JFM: Jan - Mar

FMA: Feb - Apr

MAM: Mar - May

AMJ: Apr - Jun

MJJ: May - Jul

JJA: Jun - Aug

JAS: Jul - Sep

Forecast Type

Water Supply Network: Volumes are adjusted for significant upstream reservoir storage, as described in the adjustment section of the NWRFC water suppy webpage.

Natural Volume Network: Volumes are adjusted for all man-made upstream activity, including storage, consumptive use, and diversion activity.

- APR-SEP
- APR-JUL
- APR-AUG
- JAN-SEP
- JAN-JUL
- OCT-SEP

Current ESP volume forecast

Summary

- **2016wy Review Summary**
  - Very strong ENSO signal – tied with highest ONI value on record
  - Slightly below normal precipitation
  - Above normal temperatures
  - Very rapid snowmelt in April
  - Below normal runoff volume

- **2017wy Summary**
  - Above normal precipitation for Oct – Dec
  - Substantially cooler temperatures in Dec
  - Above normal snowpack in WA and OR Cascades, Upper Snake
  - Near or below normal snowpack in Upper Columbia and Eastern WA
  - ESP water supply volume forecast above normal in the Upper/Mid Snake River Basin, near normal in Upper and Mainstem Columbia River.

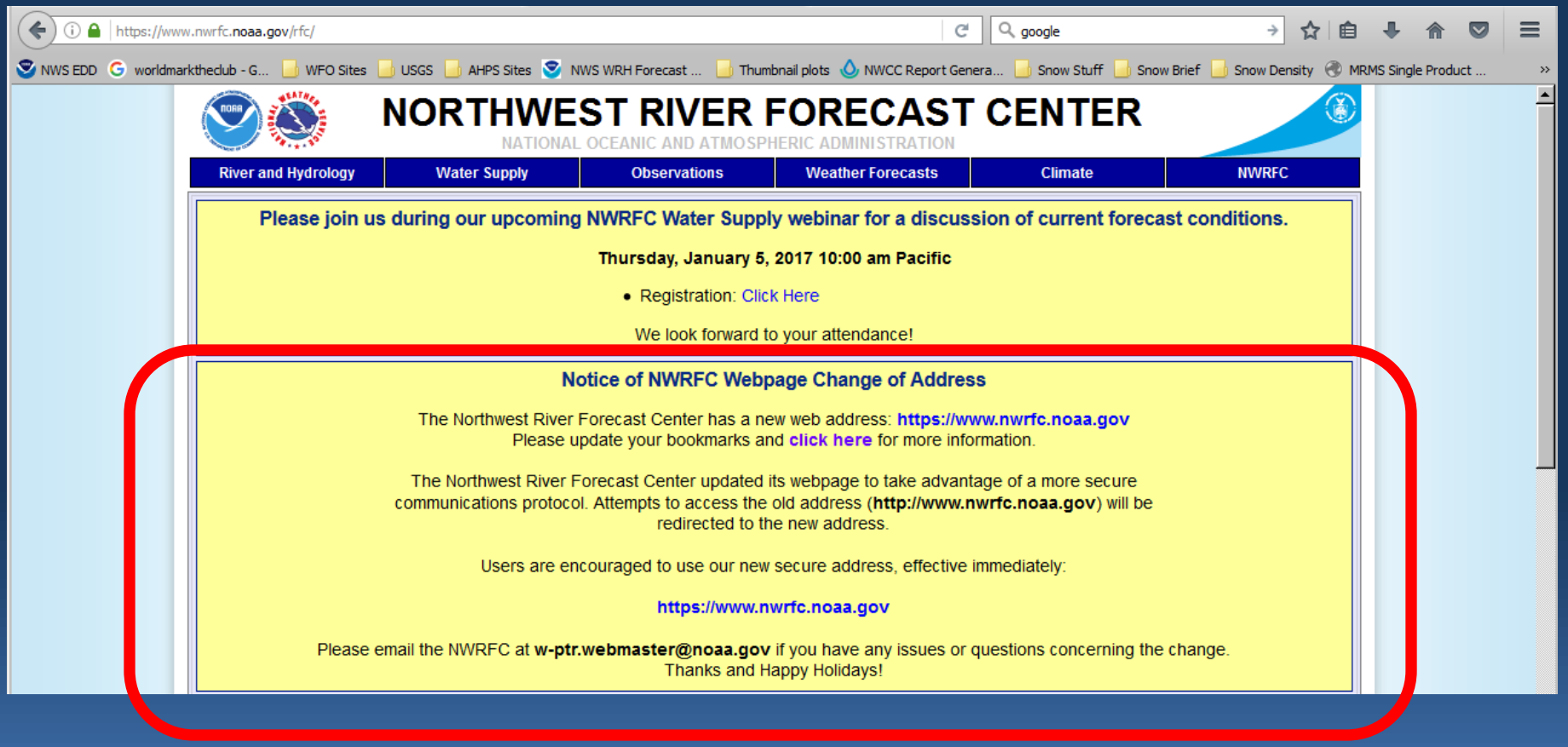
NWRFC 2017 Water Supply Briefing Schedule

2017 Schedule for *Live* Water Supply Briefings				
Jan	Feb	Mar	Apr	May
5	2	2	6	4
All presentations held at 10:00am PDT/PST, unless noted otherwise				
Click here for Registration Information				

Telephone Conference Call Number (same for each month's brief):
1-888-677-0012
Pass Code: 91999

https://attendee.gotowebinar.com/rt/8111931086353869315

NWRFC Webpage Address Change
https://www.nwrfc.noaa.gov/rfc




Northwest River Forecast Center
Water Supply Forecasts
River and Hydrology
Water Supply
Observations
Weather Forecasts
Climate
NWRFC
Questions?
kevin.berghoff@noaa.gov
W-ptr.Webmaster@noaa.gov
(503)326-7291